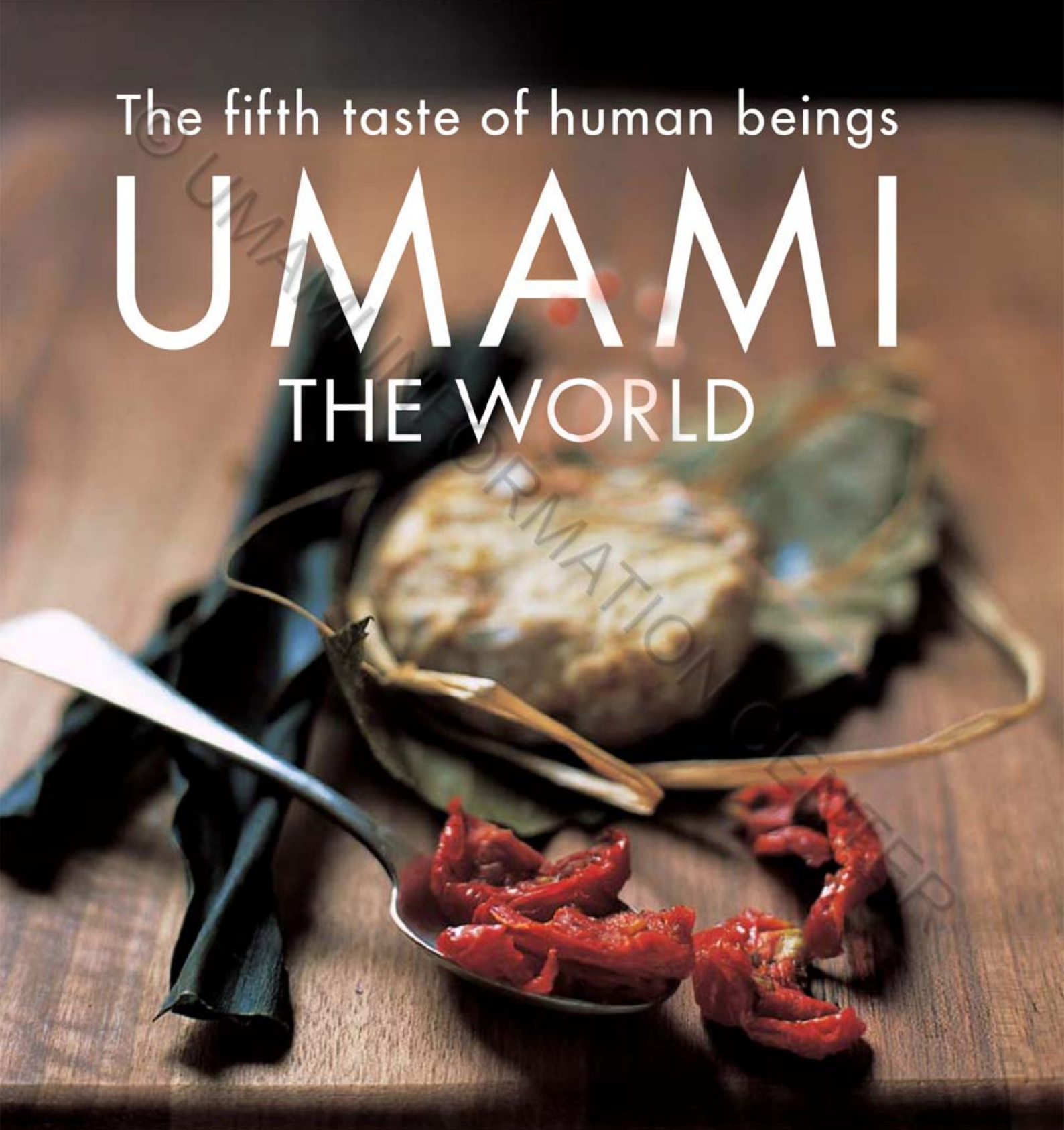



The fifth taste of human beings

# UMAMI

## THE WORLD



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Introduction: A Universal Taste The World Over

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Who first identified the taste of glutamate?

Eastern discoveries versus Western

The flavor of food is determined by a number of different factors including taste, smell, color, temperature and overall appearance, as well as by physiological or psychological conditions. The most important factors are the basic tastes of sweet, sour, salty, bitter and umami. Although there is no English word for it, umami is a savory taste imparted by glutamate and ribonucleotides, including inosinate and guanylate, which occur naturally in many foods including meat, fish, vegetables and dairy products. The taste of umami itself is subtle. It blends well with other tastes to expand and round out flavors. Most people don't recognize umami when they encounter it, but it can be detected when eating tomatoes, Parmesan cheese, cured ham, mushrooms, sun-dried tomatoes, meat and fish, etc.

Who first identified the taste of glutamate?

Almost 100 years ago, a Japanese scientist, Prof. Kikunae Ikeda, recognized a common factor in the complicated flavors of asparagus, tomatoes, cheese and meat, which was quite distinctive and could not be classified under any of the well defined taste qualities: sweet, sour, salty and bitter. He started investigating the main taste substance of dried seaweed (konbu), because he could detect it most clearly in soup stock prepared with

konbu. Soup stock or 'dashi', in Japanese has been traditionally used in Japanese cuisine for more than 1000 years. He discovered that the taste was produced by glutamate contained in dried konbu, and named it 'umami'. After the discovery of umami, Ikeda tried to develop a new flavoring substance based on glutamate, compatible with the natural taste of foods. Finally he found that monosodium glutamate (MSG) was the best flavoring because it was readily soluble in water, had a strong umami taste, high stability, and absorbed no humidity. MSG was first marketed in Japan in 1909. His discovery of umami, along with the introduction of the new seasoning, MSG, made an important contribution to the food industry. His idea of using glutamate, which is one of the amino acids (building blocks of protein), in seasoning, was the world's first product based on a single amino acid. The Japanese Government Patent Office have listed Prof. Ikeda as one of the ten greatest Japanese inventors. For more information, visit [www.jpo.go.jp](http://www.jpo.go.jp)

Eastern discoveries versus Western

Bouillon has traditionally been used in western countries. Bouillon cubes were first commercially made by the Swiss flour manufacturer, Julius Maggi, in 1882. He developed and produced them for people who could not

afford meat, as an inexpensive method of making nutritious soup. Rapid-cooking dehydrated soups evolved into an important business segment in Western countries. A meaty flavor from hydrolyzed plant protein was an indispensable factor used to satisfy Western people. At that time, it was not known that this taste was mainly imparted by glutamate, which is most abundant in protein hydrolysates. Two discoveries; the bouillon cube in the West and MSG in the East, reflect traditional dietary culture in Europe and Japan. The taste of bouillon is made up of various components contained in meat and vegetables. The taste of dashi is mainly made up of glutamate from dried konbu or nucleotides from dried bonito. The most important taste element in both bouillon and dashi is umami, imparted by glutamate or nucleotides. Although the traditional way of enriching taste in various dishes in Europe and Japan differs, the key component in the bouillon cube and MSG is the same; umami by glutamate.

As a Japanese scientist first discovered umami, many people believe it to be a uniquely oriental taste element, but in fact it has existed traditionally not only in Eastern, but also Western culture. The story of 'Umami in Western Cuisine' by Elisabeth Rozin starting on page 33 will give you a new insight into the taste.

## Umami In Asian Countries

- Fermented products in Southeast Asia
- Chinese cuisine and umami
- Traditional Japanese cuisine 
  - Konbu
  - Dried bonito (katsubushi)
  - Dashi, the most simple umami soup 
    - Soy sauce
- Culinary art and science
- Making the most of konbu

Umami rich ingredients have been valued not only for their taste but also for their ability to enhance and bring out the original flavor of food. Fermented fish sauce and paste made from fish or small shrimps and fermented bean products, have long been used in Asian countries.

If you take a look at a map showing areas where rice was cultivated in the 15th century, you will see that rice was cultivated in most of the Asian countries. Rice is an important food material, used to sustain the large populations of Asian countries. As the protein in rice is better quality than that of wheat, rice is eaten as a source of protein as well as carbohydrate,



while people in Western countries keep a nutritional balance by eating meat, poultry and dairy products as a protein source, and wheat or potatoes as carbohydrates. In Asian countries, people eat a variety of nutritionally balanced fermented food with plain steamed rice, or as a rich accompaniment to cooked rice. The combination of salt and umami is a very important taste component which provides a fantastic harmony of tastes when eaten with rice.

#### Fermented products in Southeast Asia

There is a wide variety of different fermented products in Asian countries, e.g. nam pla in Thailand, nuoc mam in Vietnam, terasi in Indonesia, ngapi in Burma, bagoong in the Philippines, etc. All of these products are made by fermenting fish or shrimps. Prof. Ishige, a Japanese dietary histologist, conducted a large-scale survey on around three hundred different kinds of fermented fish and shrimp products in 13 Asian countries in the early 1980s. He reported that fermented products in Asian countries are usually used like salt or seasonings in Western countries. Fermented fish or shrimp products are made by first adding large amounts of salt to fresh fish or shrimps and then keeping them under natural sunshine for at least

three months. The natural protein in them decomposes into various amino acids. These amino acids and salt are important taste substances in these fermented products. Analyses of the amino acid content in fermented products show that glutamate is the most abundant amino acid. A comparison between taste components of fish sauce and soy sauce shows that salt in fish sauce, at 26%, is higher than that of soy sauce, at 17%, while the amino acid content in fish and soy sauces is almost the same, at 5%. Of the twenty kinds of different amino acids found in both sauces, levels of glutamate, the most abundant amino acid, are around 0.8% in both sauces. Thus the biggest difference between fish and soy sauce is the salt content. Fish sauces simply add a salty and umami taste to dishes. In Southeast Asian countries, fish sauces are used like seasoning.

There are different grades of fish sauce. Prof. Ishige showed that the grade of fish sauce, namely the cost of the fish sauce, depended on the glutamate content. The most expensive sauce, the 'first grade', has the highest content of glutamate. The higher the grade, the more glutamate the sauce contains. From their long experience in the use of fish sauces in cooking, people in Southeast Asian countries have realized that umami and salt are important taste enhancers.

